

Assumptions to the Annual Energy Outlook 2010

Table 12.1. Coal Mining Productivity by Region
(Short Tons per Miner Hour)

Supply Region	2008	2015	2020	2025	2030	2035	Average Annual Growth 08-35
Northern Appalachia	3.70	3.51	3.49	3.44	3.40	3.35	-0.4%
Central Appalachia	2.69	2.34	2.19	2.07	2.04	1.96	-1.2%
Southern Appalachia	2.08	1.89	1.76	1.70	1.67	1.65	-0.8%
Eastern Interior	4.22	4.14	4.12	4.11	4.08	4.05	-0.2%
Western Interior	2.35	2.32	2.32	2.32	2.32	2.32	0.0%
Gulf Lignite	7.79	6.77	6.60	6.44	6.28	6.13	-0.9%
Dakota Lignite	15.49	15.09	15.47	15.86	16.26	16.67	0.3%
Western Montana	20.82	14.43	14.95	15.92	18.55	19.20	-0.3%
Wyoming, Northern Power River Basin	33.79	30.99	30.22	29.48	28.75	28.03	-0.7%
Wyoming, Southern Power River Basin	37.58	34.47	33.62	32.78	31.97	31.18	-0.7%
Western Wyoming	8.17	7.84	7.97	8.15	8.47	8.48	0.1%
Rocky Mountain	6.23	5.52	5.50	5.47	5.42	5.38	-0.5%
Arizona/New Mexico	8.54	8.80	8.88	8.95	9.00	9.05	0.2%
Alaska/Washington	6.29	6.29	6.29	6.29	6.29	6.29	0.0%
U.S. Average	5.96	6.09	6.10	6.38	6.62	6.51	0.3%

Source: Energy Information Administration, AEO2010 National Energy Modeling System run AEO2010r.D111809a.

Table 12.2. Transportation Rate Multipliers
(Constant Dollar Index, 2008=1.000)

Scenario	Region:	2008	2015	2020	2025	2030	2035
Reference Case	East	1.000	1.0101	1.0064	0.9925	0.9988	0.9968
	West	1.000	1.0236	1.0267	1.0412	1.0520	1.0504
High Resource Price	East	1.000	1.0160	1.0125	1.0165	1.0100	1.0044
	West	1.000	1.0217	1.0173	1.0229	1.0390	1.0379
Low Resource Price	East	1.000	1.0037	1.0033	0.9982	0.9949	0.9956
	West	1.000	1.0186	1.0353	1.0650	1.0694	1.0752
High Economic Growth	East	1.000	1.0104	1.0045	0.9934	0.9991	0.9956
	West	1.000	1.0251	1.0393	1.0566	1.0716	1.0701
Low Economic Growth	East	1.000	1.0076	1.0111	0.9972	1.0063	1.0108
	West	1.000	1.0181	1.0181	1.0279	1.0359	1.0323
High Coal Cost	East	1.000	1.0700	1.1100	1.1500	1.2000	1.2500
	West	1.000	1.0800	1.1400	1.2000	1.2600	1.3100
Low Coal Cost	East	1.000	0.9500	0.9000	0.8400	0.8000	0.7500
	West	1.000	0.9600	0.9200	0.8800	0.8400	0.7900

Source: Projections: Energy Information Administration, National Energy Modeling System runs AEO2010r.D111809A, HP2010.D011910A, LP2010.D011910A, HM2010.D020310A, LM2010.D011110A, HCCST10.D120909A, LCCST10.D120909A. Based on methodology described in *Coal Market Module of the National Energy Modeling System 2010*, DOE/EIA-M066(2010) (Washington, DC, 2010).

Table 12.3. World Steam Coal Import Demand by Import Region

(Million metric tons of coal equivalent)

Import Regions ¹	2008 ²	2015	2020	2025	2030	2035
The Americas	59.7	53.6	58.6	60.0	68.2	84.0
United States ³	25.7	24.2	30.1	27.4	30.1	43.1
Canada	16.2	9.7	7.8	8.2	8.2	8.2
Mexico	3.0	5.5	6.4	7.9	11.0	12.1
South America	14.8	14.2	14.3	16.6	19.0	20.7
Europe	163.9	194.7	179.8	177.0	176.3	176.8
Scandinavia	10.6	7.9	6.5	5.8	4.9	4.5
U.K./Ireland	35.6	42.6	28.6	29.5	30.8	32.1
Germany/Austria	33.7	38.5	38.3	37.3	36.3	35.3
Other NW Europe	23.1	22.6	22.6	20.7	19.8	19.0
Iberia	19.4	21.5	20.4	19.0	17.5	16.2
Italy	12.7	25.1	26.9	26.9	26.9	26.9
Med/E Europe	28.8	36.5	36.5	37.8	40.1	42.8
Asia	314.3	362.6	389.1	421.0	467.1	518.7
Japan	94.1	87.6	85.0	82.3	80.1	78.0
East Asia	112.3	112.3	113.8	120.7	131.0	142.3
China/Hong Kong	42.5	65.5	73.4	81.5	89.2	97.8
ASEAN	32.0	41.0	50.2	60.5	67.9	76.2
Indian Sub	33.4	56.2	66.7	76.0	98.9	124.4
Total	537.9	610.9	627.5	658.0	711.6	779.5

¹Import Regions: **South America:** Argentina, Brazil, Chile, Puerto Rico; **Scandinavia:** Denmark, Finland, Norway, Sweden; **Other NW Europe:** Belgium, France, Luxembourg, Netherlands; **Iberia:** Portugal, Spain; **Med/E Europe:** Algeria, Bulgaria, Croatia, Egypt, Greece, Israel, Malta, Morocco, Romania, Tunisia, Turkey; **East Asia:** North Korea, South Korea, Taiwan; **ASEAN:** Malaysia, Philippines, Thailand; **Indian Sub:** Bangladesh, India, Iran, Pakistan, Sri Lanka.

²The base year of the world trade projection for coal is 2008.

³Excludes imports to Puerto Rico and the U.S. Virgin Islands.

Notes: One "metric ton of coal equivalent" contains 27.78 million Btu. Totals may not equal sum of components due to independent rounding.

Table 12.4. World Metallurgical Coal Import Demand by Import Region

(Million metric tons of coal equivalent)

Import Regions ¹	2008 ²	2015	2020	2025	2030	2035
The Americas	21.1	25.0	28.7	31.9	35.8	40.3
United States	1.3	1.3	1.3	1.3	1.3	1.3
Canada	3.4	3.2	3.1	3.0	2.9	2.7
Mexico	1.0	1.0	1.0	1.0	1.0	1.0
South America	15.4	19.4	23.2	26.6	30.6	35.2
Europe	64.0	58.2	58.4	58.3	58.5	58.7
Scandinavia	2.7	2.6	2.7	2.7	2.7	2.7
U.K/Ireland	6.5	7.2	7.2	7.2	7.2	7.3
Germany/Austria	11.5	9.3	9.3	9.2	9.2	9.2
Other NW Europe	17.2	14.8	14.6	14.4	14.4	14.2
Iberia	3.8	4.0	3.9	3.8	3.7	3.6
Italy	7.4	7.4	7.3	7.3	7.2	7.2
Med/E Europe	14.9	12.9	13.4	13.7	14.1	14.5
Asia	141.2	160.6	166.9	184.2	188.9	195.2
Japan	81.4	73.1	72.1	69.2	66.3	63.4
East Asia	31.4	32.9	34.0	35.2	36.3	37.5
China/Hong Kong	2.2	15.4	17.3	24.0	28.4	33.5
ASEAN	0.0	0.0	0.0	0.0	0.0	0.0
Indian Sub	26.2	39.2	43.5	55.8	57.9	60.8
Total	226.3	243.8	254.0	274.4	283.2	294.2

¹Import Regions: **South America:** Argentina, Brazil, Chile, Puerto Rico; **Scandinavia:** Denmark, Finland, Norway, Sweden; **Other NW Europe:** Belgium, France, Luxembourg, Netherlands; **Iberia:** Portugal, Spain; **Med/E Europe:** Algeria, Bulgaria, Croatia, Egypt, Greece, Israel, Malta, Morocco, Romania, Tunisia, Turkey; **East Asia:** North Korea, South Korea, Taiwan; **ASEAN:** Malaysia, Philippines, Thailand; **Indian Sub:** Bangladesh, India, Iran, Pakistan, Sri Lanka.

² The base year of the world trade projection for coal is 2008.

Notes: One "metric ton of coal equivalent" contains 27.78 million Btu. Totals may not equal sum of components due to independent rounding.

Source: Projections: Energy Information Administration, Office of Integrated Analysis and Forecasting.

Table 12.5. Production, Heat Content, and Sulfur, Mercury and Carbon Dioxide Emission Factors by Coal Type and Region

Coal Supply Region	States	Coal Rank and Sulfur Level	Mine Type	2008 Production (Million Short tons)	Heat Content (Million Btu per Short ton)	Sulfur Content (Pounds Per Million Btu)	Mercury Content (Pounds Per Trillion Btu)	CO ₂ (Pounds Per Million Btu)
Northern Appalachia	PA, OH, MD, WV(North)	Metallurgical	Underground	7.6	26.28	0.73	N/A	207.5
		Mid-Sulfur Bituminous	All	55.1	25.19	1.28	11.17	207.5
		High-Sulfur Bituminous	All	73.0	24.80	2.51	11.67	205.7
		Waste Coal (Gob and Culm)	Surface	13.7	12.35	2.68	63.9	205.7
Central Appalachia	KY(East), WV (South), VA, TN (North)	Metallurgical	Underground	46.5	26.28	0.69	N/A	205.9
		Low-Sulfur Bituminous	All	34.1	24.83	0.54	5.61	205.9
		Mid-Sulfur Bituminous	All	153.7	24.67	0.89	7.58	205.9
Southern Appalachia	AL, TN(South)	Metallurgical	Underground	9.3	26.28	0.56	N/A	205.4
		Low-Sulfur Bituminous	All	0.5	24.41	0.52	3.87	205.4
		Mid-Sulfur Bituminous	All	11.3	24.07	1.27	10.15	205.4
East Interior	IL, IN, KY(West), MS	Mid-Sulfur Bituminous	All	20.9	22.54	1.07	5.6	205.0
		High-Sulfur Bituminous	All	78.4	22.85	2.63	6.35	204.7
		Mid-Sulfur Lignite	Surface	2.8	10.14	0.95	14.11	213.5
West Interior	IA, MO, KS, AR, OK, TX(Bit)	High-Sulfur Bituminous	Surface	2.0	22.74	2.05	21.55	204.4
Gulf Lignite	TX(Lig), LA	Mid-Sulfur Lignite	Surface	36.4	13.39	1.21	14.11	213.5
		High-Sulfur Lignite	Surface	6.5	11.79	3.04	15.28	213.5
Dakota Lignite	ND, MT(Lig)	Mid-Sulfur Lignite	Surface	30.0	13.26	1.13	8.38	218.8
Western Montana	MT(Bit and Sub)	Low-Sulfur Subbituminous	Underground	0.2	19.80	0.60	5.06	209.6
		Low-Sulfur Subbituminous	Surface	26.6	18.32	0.38	5.06	213.4
		Mid-Sulfur Subbituminous	Surface	17.6	17.07	0.80	5.47	213.4
Northern Wyoming	WY(Northern Powder River Basin)	Low-Sulfur Subbituminous	Surface	183.5	16.80	0.37	7.08	212.7
		Mid-Sulfur Subbituminous	Surface	4.1	16.16	0.73	7.55	212.7
Southern Wyoming	WY(Southern Powder River Basin)	Low-Sulfur Subbituminous	Surface	264.1	17.57	0.31	5.22	212.7
Western Wyoming	WY(Other Basins excluding Powder River Basin)	Low-Sulfur Subbituminous	Underground	3.5	18.78	0.65	2.19	206.5
		Low-Sulfur Subbituminous	Surface	5.3	19.05	0.45	4.06	212.7
		Mid-Sulfur Subbituminous	Surface	7.1	19.31	0.83	4.35	212.7
Rocky Mountain	CO, UT	Low-Sulfur Bituminous	Underground	48.7	23.12	0.47	3.82	205.1
		Low-Sulfur Subbituminous	Surface	7.7	20.38	0.42	2.04	212.7
Arizona/ New Mexico	AZ, NM	Low-Sulfur Bituminous	Surface	8.4	21.68	0.52	4.66	207.5
		Mid-Sulfur Subbituminous	Surface	18.3	18.39	0.89	7.18	208.8
		Mid-Sulfur Bituminous	Underground	7.0	19.03	0.70	7.18	208.8
Alaska/ Washington	WA, AK	Mid-Sulfur Subbituminous	Surface	1.5	15.48	0.24	6.99	210.0

N/A = not available.

*Indicates that quantity is less than 50,000 short tons.

Source: Energy Information Administration, Form EIA-3, "Quarterly Coal Consumption Report—Manufacturing Plants"; Form EIA-5, "Quarterly Coal Consumption and Quality Report, Coke Plants"; Form EIA-6A, "Coal Distribution Report—Annual"; Form EIA-7A, "Coal Production Report", and Form EIA-923, "Power Plant Operations Report". U.S. Department of Commerce, Bureau of the Census, "Monthly Report EM-545." U.S. Environmental Protection Agency, Emission Standards Division, *Information Collection Request for Electric Utility Steam Generating Unit, Mercury Emissions Information Collection Effort* (Research Triangle Park, NC, 1999). B.D. Hong and E.R. Slatick, "Carbon Dioxide Emission Factors for Coal," in Energy Information Administration, *Quarterly Coal Report*, January-March 1994, DOE/EIA-0121 (94/Q1) (Washington, DC, August 1995).